

MEMORANDUM

DATE: February 26, 1998

TO: Judith Johnson
Acting Assistant Secretary
for Elementary and Secondary Education

FROM: Richard J. Dowd
Regional Inspector General
for Audit, Chicago, Illinois

SUBJECT: *Review of the Detroit Public Schools' Year 2000 Readiness Plans*, Control
Number: A05-90021

Attached is our Management Information Report that informs you of the results of our review of Detroit Public Schools' [DPS] Year 2000 readiness plans. Our objective was to determine if DPS management has developed a plan to (1) achieve year 2000 compliance for its computer systems, and (2) monitor the implementation. We also were ensuring that DPS was successfully meeting milestones for each Year 2000 phase (awareness, assessment, renovation, validation, and implementation).

Our review of the DPS' Year 2000 readiness plans indicates that the entity has sufficient controls in place to reasonably ensure it is making satisfactory progress in its Year 2000 efforts. We believe that the DPS' Year 2000 efforts are satisfactory because the entity exhibits acceptable performance in all key phases of the Year 2000 project management process.

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ATTACHMENT

Review of Detroit Public Schools' Year 2000 Readiness Plans

MANAGEMENT INFORMATION REPORT



Control Number A05-90021
February 1999

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U.S. Department of Education
Office of Inspector General
Chicago, IL

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Executive Summary

Our review of the Detroit Public Schools' [DPS] Year 2000 readiness plans indicates that the entity appears to have sufficient controls in place to reasonably ensure it is making satisfactory progress in its Year 2000 efforts. We believe that DPS' Year 2000 efforts are satisfactory, because the entity exhibits acceptable performance in all key phases of the Year 2000 project management process (See **Appendix** for a description of acceptable performance). However, DPS has not established an overall organizational contingency plan. DPS recognizes that it must have a contingency plan in the event of a Year 2000-induced system failure. DPS plans to hire a vendor shortly to complete a contingency plan which will include a disaster recovery plan and a business resumption plan. If it does not develop a contingency plan, DPS could experience severe adverse effects in the event of a system failure related to a Year 2000 problem.

The U.S. Department of Education (ED) has a responsibility to ensure that all of its computer systems and the interface between them and the systems of its trading partners are ready to handle data that includes dates both before and after January 1, 2000. ED has issued various publications to reinforce the seriousness of Year 2000 compliance and the critical milestone dates for each of the five phases set forth by the General Accounting Office (GAO).

We conducted our on-site fieldwork at DPS in Detroit, Michigan from January 4 through 15, 1999. We examined documentation supporting DPS' progress for each phase of the Year 2000 project. We learned that DPS has already completed the awareness and assessment phases for all five of its Year 2000 projects. In addition, DPS has already completed the renovation, validation, and implementation phases for part of one of its Year 2000 projects and the renovation phase for another.

DPS established a Year 2000 steering committee in November 1997 and through its Board of Education, upgraded its computer system and hired five contractors to ensure all electronic systems are Year 2000 compliant. In addition, DPS hired an outside firm to oversee and manage its Year 2000 projects. DPS assigned internal Project Managers responsibility for coordinating the projects and ensuring they are completed in accordance with the contracts.

DPS elected to use a process called Windowing to make its systems Year 2000 compliant. Windowing involves modifying the computer logic so the current two digit date field can still be used into the Year 2000. It modifies the program logic to interpret dates based on a date window.

To ensure its electronic systems are Year 2000 compliant, DPS has three projects to convert and replace current mission critical software, one of which includes purchasing and installing new hardware. In addition, DPS has one project to renovate all personal computers using a commercially available renovation tool and another to identify and ensure all electronic systems with embedded micro chips are Year 2000 compliant.

Background

DPS, Michigan's largest school district, has 169 elementary schools, 44 middle schools, 28 high schools, and 20 other centers of learning. The DPS participated in 14 Federal programs, 11 programs funded through the Michigan Department of Education, Michigan Job Commissions, and Wayne County Intermediate School District and 3 programs funded directly by ED. These agencies awarded DPS \$116,760,806 during the 1997-98 award year.

ED is in the process of ensuring that all of its computer systems and the interface between them and the systems of its trading partners are Year 2000 compliant. Year 2000 compliance (or readiness) refers to the capability of a product to correctly process, provide, and/or receive data containing dates from, into, and between the 20th and 21st centuries. The system's ability to accurately process date/time data is crucial to continuing a business' normal operations beyond the turn of the century. Failure to address this issue could result in a system's erroneous execution or the inability to execute at all.

On October 6, 1998 the ED Deputy Secretary issued an Advisory to Federal Grantees on Responsibility to Address the Year 2000 Issue to entities receiving ED funding. The advisory's purpose was to reinforce the importance of addressing the Year 2000 issue through aggressive strategies and action plans. In addition, in November 1998 ED issued a Year 2000 Readiness Kit which is a compilation of Year 2000 resources for schools, colleges and universities.

DPS' Year 2000 Projects

DPS has established a Year 2000 project team that combines internal project managers, internal computer facilities, and external contractors or vendors. According to DPS officials, the Year 2000 project grew out of previous plans to replace or update hardware and software. These plans were previously delayed due to budget constraints.

In November, 1997 DPS established a Year 2000 steering committee. With funds committed through its Board of Education, DPS purchased a new computer system to replace the old one that it had outgrown. Based on the results of a Year 2000 assessment completed in March 1998, and the previously delayed plans, the Board of Education approved contracts with outside vendors for five Year 2000 projects. In addition, DPS hired an outside firm to oversee its Year 2000 project. For each of its projects, DPS designated in-house personnel as Project Managers. The Project

Managers are responsible for coordinating the projects and ensuring they are completed in accordance with the contracts.

The five projects to make DPS' electronic systems Year 2000 compliant include:

- PROJECT 1: A project to replace the current payroll and personnel systems with a Year 2000 compliant version of PeopleSoft. This is a mission critical software.
- PROJECT 2: A project to convert the Comprehensive Information Management for Schools [CIMS] applications and non-CIMS applications. Two CIMS applications, Student Management System and Financial Management System, are mission critical software.
- PROJECT 3: A project to replace the current food service application with a Year 2000 compliant version. This project includes purchasing and installing new hardware. This is a mission critical software.
- PROJECT 4: A project to identify and renovate all personal computers using the commercially available renovation tool PC Fix 2000.
- PROJECT 5: A project to identify and ensure all equipment and communication systems with embedded micro chips are Year 2000 compliant.

Without these system changes, the CIMS financial system would fail July 1, 1999 when the budget process begins for the Year 2000. Therefore, DPS determined that all mission critical systems projects needed to be completed by July 1, 1999. The other projects have to be completed prior to December 31, 1999.

Year 2000 Phases

Contingency Planning

Contingency planning for a Year 2000 project addresses the steps that would be taken to ensure the continuity of an entity's core business processes in the event of a Year 2000-induced system failure. DPS has not established an overall organizational contingency plan. However, DPS recognizes that its contingency planning must be more than just a disaster recovery plan or a

business resumption plan. DPS plans on hiring a contractor to develop an overall contingency plan. Based on our review, we found nothing that would lead us to believe DPS cannot complete the contingency planning by the Year 2000. Without a contingency plan, DPS could experience severe adverse effects in the event of a system failure related to a Year 2000 problem.

Awareness

During the awareness phase, the school district should define the Year 2000 problem, gain executive level support and sponsorship, establish a Year 2000 program team, develop an overall strategy, and ensure that everyone in the organization is fully aware of the issue. We found that (1) DPS defined Year 2000 readiness; (2) the Board of Education has fully supported the Year 2000 effort; (3) DPS has developed an organization to oversee the Year 2000 efforts and has an overall strategy; and (4) DPS continues to make others aware of its Year 2000 efforts. To further awareness among its employees and the community, DPS maintains a Year 2000 web site. Employees are encouraged to visit the web site through a message on the DPS' computer system main menu which is accessed during the work day. In addition, DPS printed and distributed posters to the schools to raise student awareness of the Year 2000 issues. DPS has fully completed the awareness phase as defined in the GAO Year 2000 guidance.

Assessment

During the assessment phase, the school district should assess the Year 2000 impact on the enterprise, identify core business areas and processes, inventory and analyze systems supporting the core business areas, and prioritize their conversion or replacement. This phase also directs the school district to develop contingency plans to handle data exchange issues as well as identify and secure the necessary resources. Though DPS believes all its systems need to be fully operational, it has identified three projects that are critical to operations.

DPS hired an outside firm to complete an assessment with the goal to "identify risk exposure and to recommend solutions for potential computer and equipment problems caused by the upcoming millennium change." The assessment included:

- , Identifying and inventorying all systems that may have a Year 2000 operational impact.
- , Analyzing the inventoried systems to assess inherent risks.
- , Identifying and segmenting mission critical systems and the assigning of priority levels based on risk.

- , Identifying third party vendors whose products are used in the operation of mission critical systems.
- , Recommending strategies and solutions to resolve the identified problems in the systems.

Two of the systems, payroll and personnel, were not analyzed because DPS was replacing them with a new Year 2000 compliant software. In addition, the food service application was not analyzed because DPS was also replacing it.

In addition to the assessment report, DPS identified 113 system interfaces used for data exchange. DPS designated a Project Manager responsible for coordinating and ensuring all interfaces worked properly. DPS has fully completed, except for contingency planning, the assessment phase as defined in the GAO Year 2000 guidance.

Renovation

During the renovation phase, a school district should convert, replace, or eliminate selected platforms, applications, databases, and utilities as well as modify the appropriate interfaces. Of the five DPS Year 2000 projects, the three mission critical projects have reached the renovation phase. DPS elected to use a process called Windowing to make its systems Year 2000 compliant. Windowing involves the modification of the computer logic so the current two digit date field can still be used into the Year 2000. The program logic is modified to interpret dates based on a date window. DPS can set the date window to interpret some two digit date fields, such as years 50-99, as being in the 20th century and the other years, 0-49, as being in the 21st century.

At the time of our field work, DPS informed us the new software for Project 1 had been installed and the vendor was in the process of ensuring the data were complete and in a useable format before testing. This process was scheduled to be completed by February 1, 1999. DPS expects this system to be completely operational by July 1, 1999. The software for Project 3 had been installed, but the vendor is still installing the hardware at each of the schools. DPS had hoped to have this system operational by July 1, 1999 but now estimates it will be completed in October 1999.

Project 2, converting CIMS and non-CIMS applications to make them Year 2000 compliant, is in varying phases of completeness. Two of the mission critical applications, the student information system and financial system, have been converted. DPS expects to

have all system applications converted and operational by July 1, 1999.

DPS fully expects to complete the renovation phase for all applications, except the food service hardware, by July 1, 1999. Our review supports DPS' assertion that it will complete the renovation phase as defined in the GAO Year 2000 guidance by the target dates.

Validation

During the validation phase, a school district should test and verify the performance, functionality, and integration of converted or replaced platforms, applications, databases, and utilities. DPS tests the replaced and converted applications on its computer system. DPS developed a Year 2000 testing methodology and each of the vendors developed or will develop a testing strategy based on the methodology. The contractor provides the testing strategy to DPS for approval prior to testing.

The contractor determines the actual degree of testing. The testing strategies need to include unit testing, system testing, and comparative testing. Comparative testing requires DPS to compare baseline data generated by running test scripts under existing production conditions to data generated using replaced or converted applications. Tests results for both 20th and 21st century data are compared to the baseline data to ensure the correctness of data processing.

At the time of our field work, DPS had completed testing the converted student information system application. DPS was ready to begin testing the converted financial system application. DPS expected to have all converted or replaced applications, except the food service application, tested and operational by July 1, 1999. Our review supports DPS' assertion that it can complete the validation phase as defined in the GAO Year 2000 guidance by the target date.

Implementation

During the implementation phase, the school district should implement (put back into normal business use) converted or replaced platforms, applications, databases, utilities, and interfaces. For DPS, once programs have been completely assessed, renovated or replaced, tested, and reviewed, they are implemented. The responsible DPS official must sign a readiness statement before the application can be moved back into production. The purpose of each readiness statement is to acknowledge that DPS has fully tested the application in the testing environment established and is ready to put it into production.

Of the three mission critical projects which require testing, DPS has partially completed and implemented only one. However, DPS told us that its target for full implementation of all renovated or replaced programs is July 1, 1999. Our review supports DPS' assertion that it can complete the implementation phase as defined in the GAO Year 2000 guidance for all projects by the target date.

Conclusion

Our review of DPS's Year 2000 readiness plans indicates that the entity is making satisfactory progress in its Year 2000 efforts. We believe that DPS' Year 2000 efforts are satisfactory because the entity exhibits acceptable performance in all key phases of the Year 2000 project management process. However, if it does not develop a contingency plan, DPS could experience severe adverse effects in the event of a system failure related to a Year 2000 problem.

Objective, Scope, and Methodology

Our objective was to determine if DPS management has developed a plan to (1) achieve Year 2000 compliance for its computer systems, and (2) monitor the implementation. We also wanted to ensure that DPS is successfully meeting milestones for each Year 2000 phase. The phases needed in a Year 2000 readiness plan, as designated by GAO, are awareness, assessment, renovation, validation, and implementation with ongoing contingency planning. Given the objectives of our review, we did not assess the adequacy of DPS' overall system of management controls. We limited our review to controls over DPS' Year 2000 efforts.

We performed on-site field work at DPS, Detroit, Michigan from January 4 through 15, 1999. For each Year 2000 phase, we reviewed documentation and interviewed managers to determine if DPS had adequate processes to meet Year 2000 milestones as planned. We did not attempt to complete work that would provide assurance that DPS' Year 2000 compliance plan will work, only that it had sufficient controls in place and was meeting or exceeding milestones.

We conducted our review according to government auditing standards applicable to the limited scope review described.

Criteria Used to Assess Progress

We assessed DPS' Year 2000 compliance efforts by using the guidance provided in GAO's September 1997 Year 2000 readiness publication entitled *Year 2000 Computing Crisis: An Assessment Guide*. This guide describes five phases (awareness, assessment, renovation, validation, and implementation), with each phase representing a major Year 2000 program activity or segment.

During the awareness phase, it is essential that executive management be fully aware of the Year 2000 problem and its potential impact on the enterprise and its customers. We wanted to ensure that DPS' plan included the following key processes:

- ! Define the Year 2000 problem and its potential impact on the enterprise
- ! Conduct a Year 2000 awareness campaign
- ! Develop a Year 2000 strategy
- ! Obtain support from executive management
- ! Establish a Year 2000 Steering Committee
- ! Identify a vendor to perform a Year 2000 assessment

During the assessment phase, school districts must determine what systems require conversion or replacement and prioritize those systems accordingly. We wanted to ensure DPS' plan included the following key processes:

- ! Define Year 2000 compliance
- ! Focus on core business areas and processes and develop a Year 2000 assessment document

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- ! Assess the severity of Year 2000-induced failures
- ! Conduct enterprise-wide inventory of information systems for each business area
- ! Develop a comprehensive automated system portfolio (inventory)
- ! Analyze system portfolio (inventory)
- ! Prioritize systems and components to be converted or replaced
- ! Establish Year 2000 project teams for business areas and major systems
- ! Develop a Year 2000 program plan
- ! Identify, prioritize, and mobilize needed resources
- ! Develop validation strategies, testing plans, and scripts
- ! Define requirements for Year 2000 test facility
- ! Identify and acquire Year 2000 tools
- ! Address implementation schedule issues
- ! Address interface and data exchange issues
- ! Initiate the development of contingency plans for mission critical systems
- ! Identify Year 2000 vulnerable systems and processes operating outside the information resource management area

The renovation phase involves making and documenting software and hardware changes, developing replacement systems, and decommissioning eliminated systems. We looked for evidence of DPS' progress on the following key processes:

- ! Convert selected applications and related systems components
- ! Replace selected applications and related system components
- ! Document code and system changes
- ! Schedule unit, integration, and system tests
- ! Retire selected applications and related system components
- ! Communicate changes of information systems to internal and external users
- ! Track conversion and replacement process, collect project metrics

During the validation phase, all converted or replaced system components must be thoroughly validated and tested to uncover errors introduced during the renovation phase, validate Year 2000 compliance, and verify operational readiness. School districts must not only test Year 2000 compliance of individual applications, but also the complex interactions between the scores of converted or replaced platforms, operating systems, utilities, applications, databases, and interfaces. We looked for evidence that DPS established the following processes:

- ! Develop and document test and compliance plans and schedules
- ! Develop strategy for managing the testing of contractor converted or implemented systems
- ! Implement automated test tools and test scripts
- ! Perform unit, integration, and system testing
- ! Define, collect, and use test metrics to manage the testing and validation process
- ! Initiate acceptance testing

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During the implementation phase, school districts must reintegrate Year 2000 compliance applications and components into the production environment. We looked for evidence that DPS established the following key processes:

- ! Define transition environment and procedures
- ! Develop an implementation schedule
- ! Resolve data exchange issues and interface concerns
- ! Complete acceptance testing
- ! Implement contingency plans
- ! Develop disaster recovery plans
- ! Implement converted and replaced systems

For contingency planning, we determined whether DPS designed its Year 2000 contingency plan to mitigate the risks associated with the failure to successfully complete renovation, validation, or implementation of its Year 2000 readiness plan as well as the failure of systems at critical dates.

An overall conclusion on the adequacy of a school district's Year 2000 efforts means determining whether the school district's performance is satisfactory, cautionary, or unsatisfactory. Performance is satisfactory when project weaknesses are minor in nature and can be readily corrected within the existing project management framework. Satisfactory progress further indicates the school district's remediation progress to date meets or nearly meets expectations laid out in its Year 2000 project plan. Senior management and the Year 2000 team recognize and understand Year 2000 risk, are active in overseeing the school district's corrective efforts, and have ensured that the necessary resources are available to address this risk area. Performance is cautionary when project weaknesses are evident or the remediation progress to date is behind schedule as laid out in the school district's Year 2000 project plan. Cautionary efforts are further identified when senior management or the Year 2000 team is not fully aware of the status of Year 2000 corrective efforts, may not have committed sufficient financial or human resources to address this risk, or may not fully understand Year 2000 implications. Year 2000 efforts are unsatisfactory when project weaknesses are serious in nature and are not easily corrected within the existing project management framework. In addition to the cautionary efforts described above, unsatisfactory performance is indicated when management or the Year 2000 team commitment is limited or their oversight activities are not evident.

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